Social vulnerability and climate change in Flood Risk Management in Scotland

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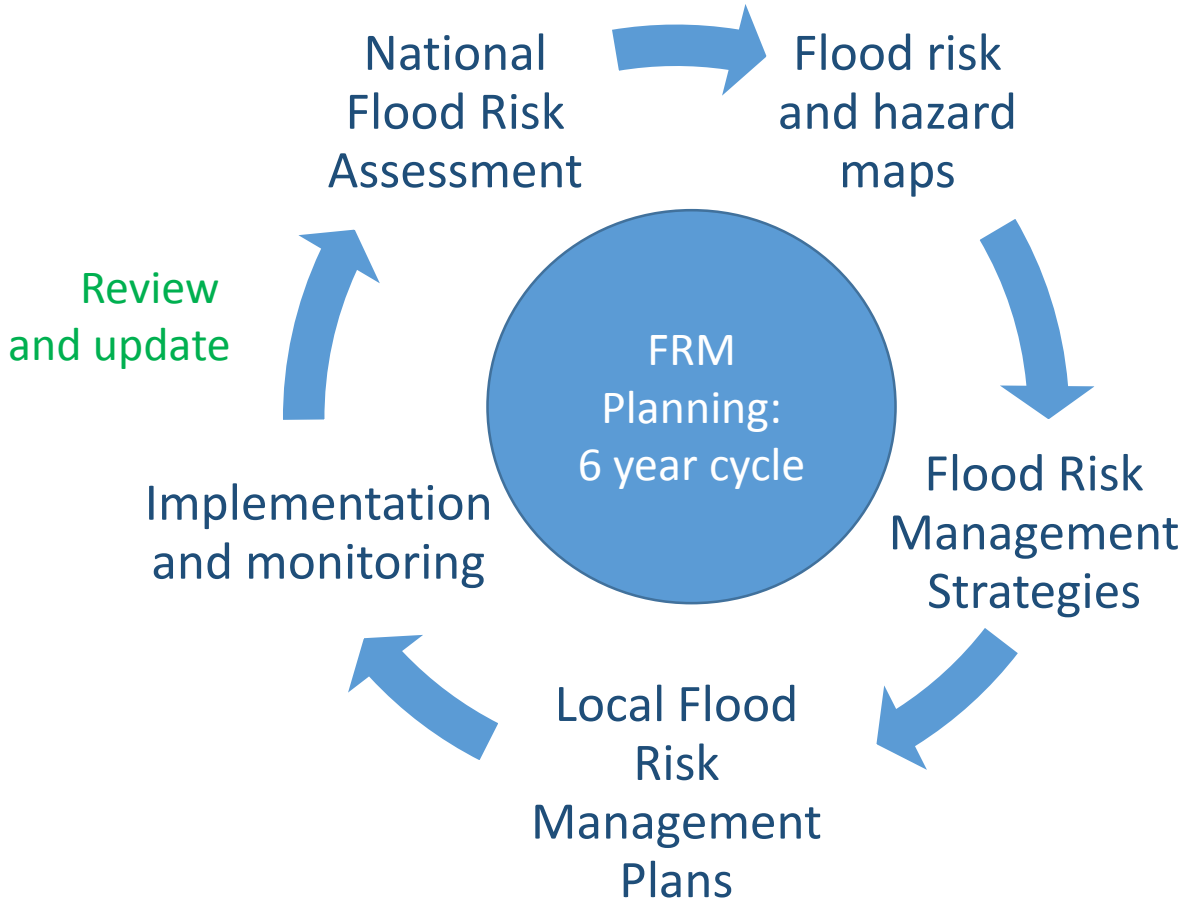
Flood Risk Management Planning

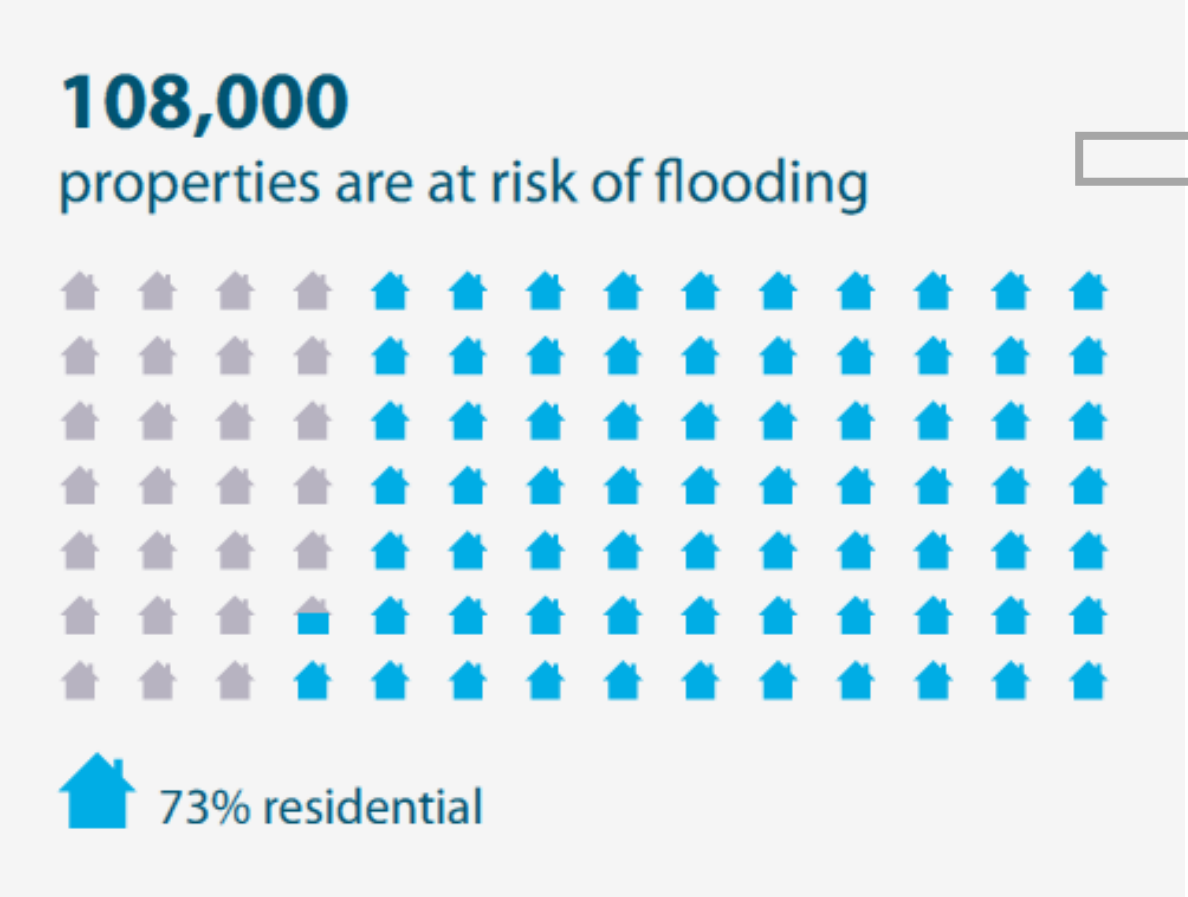
- Flood Risk Management (Scotland) Act 2009
- 6 year cycle of data development, appraisal, consultation and preparing plans
- Partnership working between responsible authorities

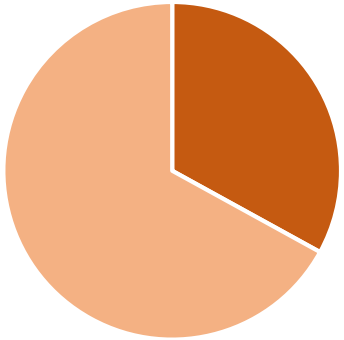


Flood Risk Management Planning

- SEPA published Scotland's first Flood Risk Management Strategies in 2015
- Local Flood Risk Management Plans were published by 14 Lead Local Authorities in 2016
- Implementation and monitoring under way
- Second planning cycle has commenced
- Second Flood Risk Management Strategies due for publication in 2021

Scotland's flooding future 2016-21



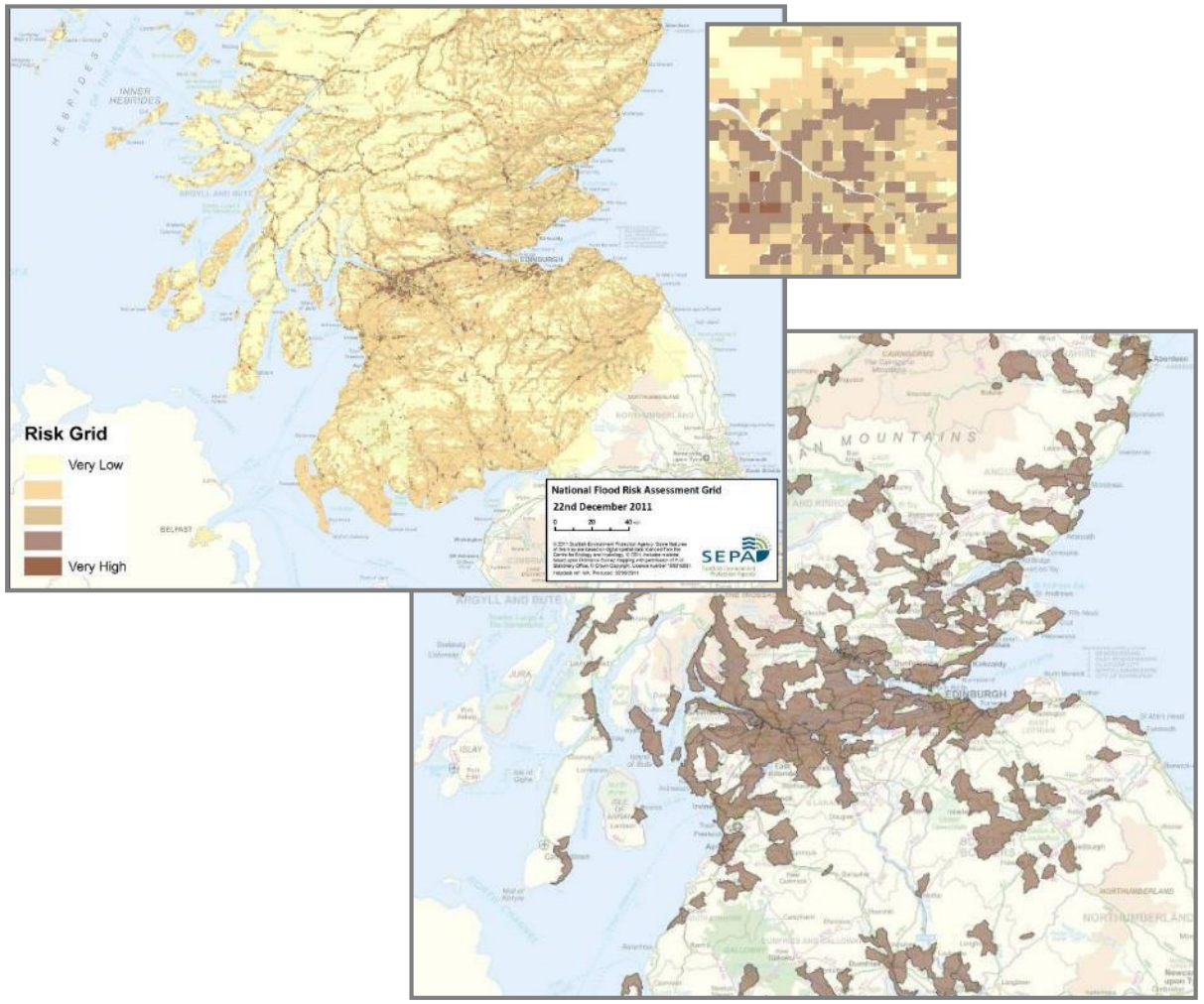


33% of these properties are in areas of higher social vulnerability

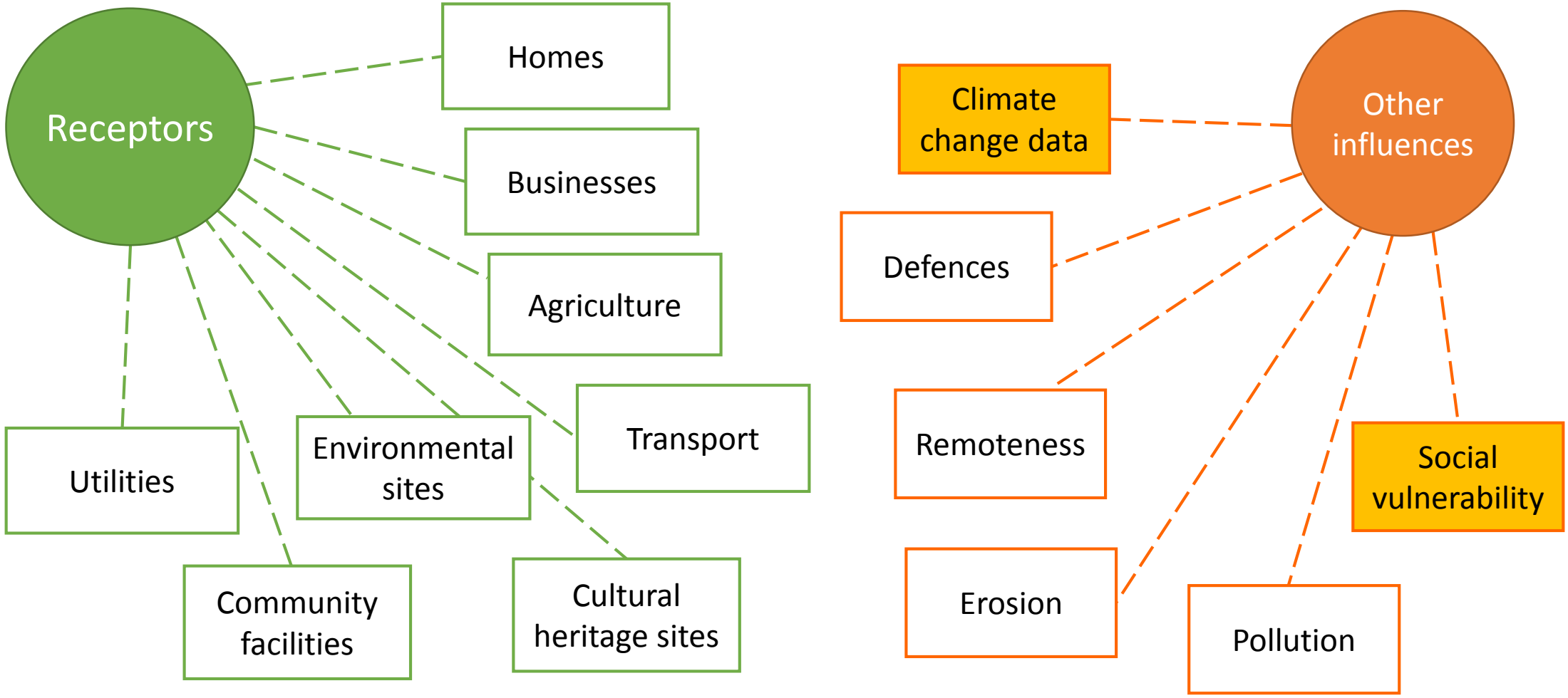
60,000 additional properties potentially at risk due to climate change

National Flood Risk Assessment

- Strategic level assessment of flood risk across Scotland
- 2011 NFRA – 2018 NFRA
- Identify areas of greatest flood risk
- Potentially Vulnerable Areas where FRM actions targeted
- Data-driven approach
- Consider a range of receptors and influences against SEPA's flood hazard maps and historical records



National Flood Risk Assessment



Social vulnerability in the NFRA

	2011	2018	
Method	• Social Flood Vulnerability Index (Tapsell et al, 2002) • 4 main indicators (8 total) • Weighting applied to the number of residential properties at risk in a grid cell to reflect cell residents' vulnerability	• Mapping Flood Disadvantage in Scotland 2015 (Kazmierczak et al, 2015) • 34 indicators spread over 14 domains • Grid cells with greater than average social vulnerability have multiplier applied to grid score	
Indicators	✓ Lone parents ✓ Aged 75+ ✓ Long term sick ✓ Financial deprivation - Non homeowners - Unemployed - Non car owners - Overcrowding	✓ Age ✓ Health ✓ Income ✓ Information use ✓ Insurance ✓ Local knowledge ✓ Tenure ✓ Mobility	✓ Social networks ✓ Physical access ✓ Crime ✓ Access to health services ✓ Housing characteristics ✓ Physical environment

Climate change in the NFRA

	2011	2018
Method	• Based on study of vulnerability of Scottish river catchments to the impacts of climate change • Weighting applied to represent the increase in economic costs in a grid cell as a result of climate change	• Based on changes in flood risk to receptors between baseline scenarios and climate change scenarios (1 in 30, 1 in 200) • Grid cells with greatest degree of change will be given greatest score in standalone 'climate change difference' grid • Enables an assessment of areas likely to have biggest impacts from climate change • Potential climate change PVAs • Timing of UKCP18

Characterisation and objective setting

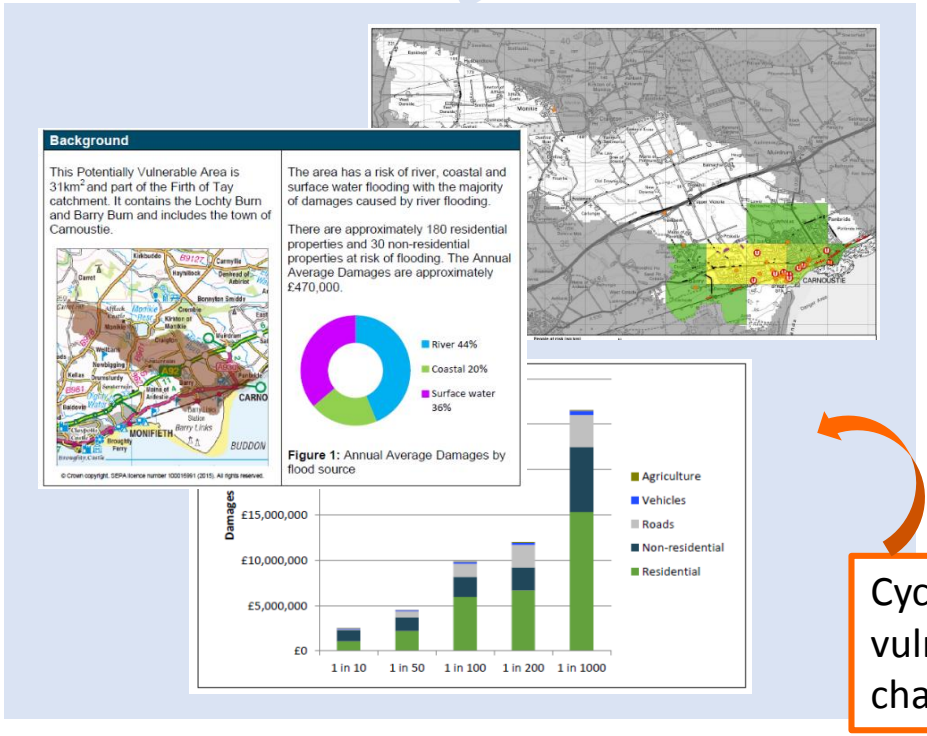
NFRA
PVA designation
Consultation

PVA characterisation

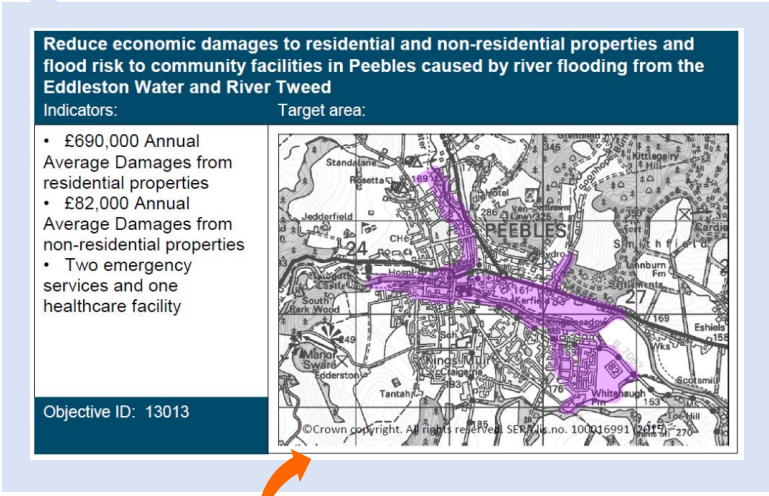
Objective setting

Action appraisal
Prioritisation

Consultation
FRM Strategies
LFRMP



Cycle 2: improved social vulnerability and climate change detail



Cycle 2: possible social vulnerability and climate change objectives?

Action appraisal and prioritisation

NFRA
PVA designation
Consultation

→ PVA characterisation → Objective setting → Action appraisal Prioritisation → Consultation FRM Strategies LFRMP

Cycle 2: further develop method for use of social vulnerability and climate change data in action appraisal and prioritisation

Action (ID):	**FLOOD PROTECTION SCHEME/WORKS (130300006)**		
Objective (ID):	Reduce economic damages to residential and non-residential properties and flood risk to community facilities caused by flooding from the River Teviot. Reduce risk to people in Hawick caused by flooding from the River Teviot (13030, 13031)		
Delivery lead:	Scottish Borders Council		
Priority:	National:	Within local authority:	
	16 of 42	1 of 1	
Status:	**Under development**	Indicative delivery:	**2016-2021**
Description:	A flood protection scheme has been proposed for Hawick. The scheme would consist of flood defence walls and embankments to provide protection to the town from flooding from the River Teviot. Scottish Borders Council is also looking at flood-proofing specific buildings and the provision of storage and pumping of seepage flows. The scheme would provide a 1 in 75 year standard of protection.		
Potential impacts			
Social:	A reduction in flood risk would have a positive benefit to the health and wellbeing of the community and socially vulnerable people located within the flood protection scheme area. In addition there are three educational buildings which have been identified as potentially benefitting from this action. There may be negative impacts through disturbance to the local community during the construction phase.		

Prioritisation process

2015

For schemes and works, studies:

- Focused on benefit cost ratio / potential economic benefits of action
- Social and environmental factors as secondary part of assessment
- Estimated increase in annual average damages in target area due to climate change
- Social vulnerability (SFVI) of action target area
- Other social factors including frequency of flooding, percentage of community affected, community facilities and utilities impacted

Flood warning schemes and strategic map updates prioritised separately.

Prioritisation process

2020

- Prioritisation across a wider range of actions – including non-structural such as awareness raising
- Criteria based on Sustainable FRM Outcomes, including:

  "A reduction in the number of people, homes and property at risk of flooding as a result of public funds being invested in actions that protect the most vulnerable and those areas at greatest risk of flooding"

  "Flood management actions undertaken that will stand the test of time and be adaptable to future changes in the climate"
- Move away from focus on economic benefits to more equal weighting between factors
- Social vulnerability of area in which action occurs
- Vulnerability to climate change – change in risk

Future developments

- Continue to improve data and utilise new research as appropriate (6 year cycle)
- Widen understanding of future flood risk beyond increase in exposure due to climate change:
  - Future social vulnerability scenarios
  - Other future changes: population / demographics, land use, urban creep
- Use understanding of current and future social vulnerability and climate change to influence type of approach:
  - Choice / design of actions
  - Approach to actions (including engagement)
- SEPA's Flooding strategy: future understanding, people focus, extended influence

Thanks!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Scottish Environment
Protection Agency
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